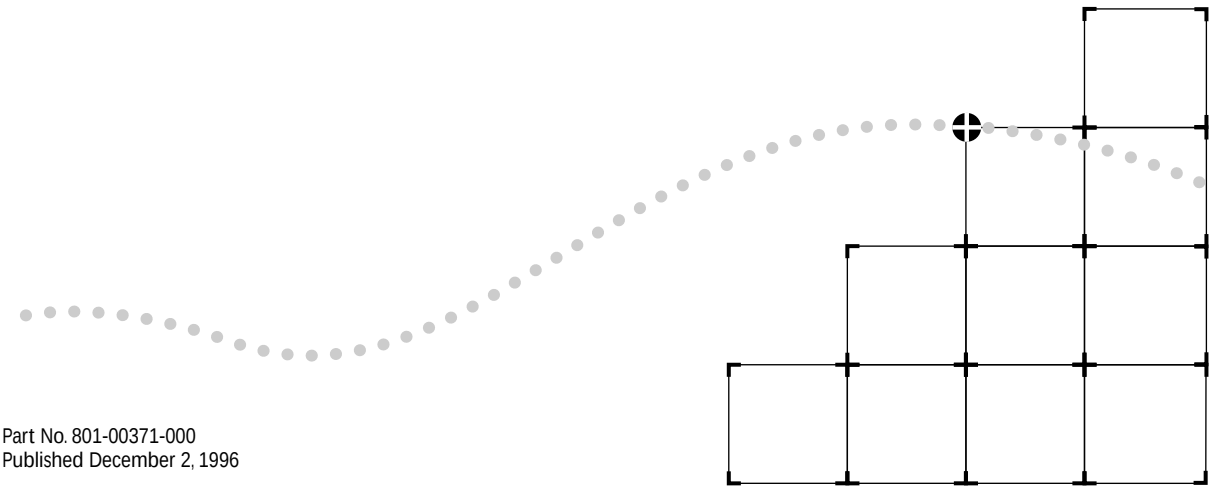
LANplex® 6000 Software Installation and Release Notes

LANplex® Extended Switching Software
Revision 8.0.2
December 2, 1996



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LANPLEX® 6000
EXTENDED SWITCHING SOFTWARE REVISION 8.0.2

Overview

These installation instructions and release notes describe revision 8.0.2 of the LANplex 6000 Extended Switching software from 3Com Corporation, dated December 2, 1996. This revision supersedes revision 8.0.1, dated November 13, 1996.

Hardware Dependencies

LANplex Intelligent or Extended Switching software revision 8.0.2 requires an LMM+ module at revision 1.21 or greater (for revision 1 modules) or revision 2.12 or greater (for revision 2 modules). If you attempt to run LANplex system software 8.0.2 on an earlier revision of the LMM+, the system will fail to reboot automatically when you turn it on.

To reboot the system, connect a terminal to the serial port on the LMM+ installed in the system. A question asking if you want to "ignore the checksum error" is displayed. Type **y** for (**yes**). The system reboots.

To verify that you have an LMM+ installed, check that the module's ejector tab is labeled "LMM+". To determine the revision of your LMM+, from the top level of the Administration Console, enter **system display**.

Upgrading Your LMM or LMM+

If you have an LMM+ at a revision earlier than 1.21 (for revision 1 modules) or 2.12 (for revision 2 modules), please call 3Com Customer Service at 1-800-876-3266, option 2. 3Com will replace your LMM+ with an LMM+ at the correct revision, free of charge. (Contact 3Com Customer Service at the same number to upgrade an LMM to an LMM+. There is a fee for this upgrade.)

Extended Switching Software Requirement

Release 8.0.0 or greater of Extended Switching Software requires a minimum of 2 MB of memory on Ethernet/FDDI Switching Modules (EFSMs). Memory configuration may vary. If you have an EFSM with 1 MB of memory, you can order a memory upgrade. Contact your sales representative.

To determine the amount of memory on the EFSM, you can either look at the lower ejector tab label or use the **`system display`** command from the top level of the Administration Console. EFSMs with only 1 MB of memory will have blank lower ejector tabs. EFSMs with minimum of 2 MB of memory have "2MB" on the lower ejector tab labels.

Release Highlights for 8.0.2

This release contains updated system diagnostics.

Release Highlights for 8.0.1

This release contains the following items:

- Support for IP routing on the FDDI Switching Module (FSM)
- Several problem fixes, which have been implemented at this release

Release Highlights for 8.0.0

This release contains the following items:

- Support for the FDDI Switching Module (FSM)
- Support for the EFSM TP-DDI Module
- Support for RMON
- RMON MIB support
- *State* field added to interface display
- System menu item *upTime* added
- New FDDI MAC statistic *rxErrors*
- New fields added to FDDI MAC summary and detail displays
- Configurable Source Route hop count limit
- LANplex MIB support updates
- Bridge MIB support for the FSM
- New If MIB

CAUTION: *The FSM module requires LANplex system software revision 8.0.0 or later and LMM+ revision 1.21 or greater (for revision 1 modules) or revision 2.12 or greater (for revision 2 modules). See "Upgrading Your LMM or LMM+" on page 5.*

The menu item `ip forwarding` *was changed to* `ip routing` *at release 7.0.0. If you have created automated scripts that include* `ip forwarding`*, you must edit these scripts to reflect this change.*

For more information about this release, see "What's New at Revision 8.0.2?" and "What's New at Revision 8.0.1?" on page 13.

Before You Start

Before you install your new software, read all of these release notes. Carefully read the sections "System Issues" on page 21 and "Known Problems" on page 22.

Updating Your System Software

You can install a new software version from any host that is running ftp server software. The system software is distributed for both UNIX® and MS-DOS® platforms.

The following media types are used to distribute compressed files for software releases:

- UNIX tar format $3^1/_2$-inch, double-sided, high-density 1.44 MB diskettes
- MS-DOS format $3^1/_2$-inch, double-sided, high-density 1.44 MB diskettes

To install or upgrade your system software, you must:

- Copy the software from the diskette to your UNIX or MS-DOS computer's hard disk.
- Decompress the software.
- Load the system software from your computer's hard disk to flash memory on the LMM+.

Details for these procedures are provided in the next section.

Copying System Software to a Hard Disk

You can copy system software to a system that has either a UNIX or an MS-DOS operating system.

Copying to the UNIX® Platform

The LANplex software for a UNIX system is distributed on five diskettes. Diskettes #1, #2, #3 and #4 contain the LANplex software. Diskette #5 contains the SNMP MIBs.

To copy the software to a UNIX hard disk, follow these instructions.

If the directory "/usr/lp6000R" does not exist on your computer, create the directory before proceeding. If your "/usr" directory is full, you can use a different directory. If you use a different directory, substitute the actual directory used for "/usr" in this and subsequent procedures.

1. Insert diskette #1 containing the system software file into the disk drive. These instructions assume drive rfd0.

2. Extract the first part of the LANplex software file using the following commands:

```
cd /usr/lp6000R
tar xvf /dev/rfd0
```

3. Remove diskette #1 using the following command:

```
# eject
```

4. Insert diskette #2 containing the LANplex software file into the disk drive and extract the second part of the file using the following command:

```
tar xvf /dev/rfd0
```

5. Remove diskette #2 using the following command:

```
# eject
```

6. Insert diskette #3 containing the LANplex software file into the disk drive and extract the third part of the file using the following command:

```
tar xvf /dev/rfd0
```

7. Remove diskette #3 using the following command:

```
# eject
```

8 Insert diskette #4 containing the LANplex software file into the disk drive and extract the fourth part of the file using the following command:

```
tar xvf /dev/rfd0
```

9 Remove diskette #4 using the following command:

```
# eject
```

The following files should be in your /usr/lp6000R directory:

- README1
- lp6000R00
- lp6000R01
- lp6000R02
- lp6000R03
- restore_lpxR

10 Use the supplied script to decompress and restore the split file (lp6000R00, lp6000R01, lp6000R02, and lp6000R03).

```
# ./restore_lpxR
```

This procedure creates the uncompressed file lp6000R. See the README1 file for file size and checksum information.

Copying to the MS-DOS® Platform

The LANplex software for an MS-DOS system is distributed on three diskettes. This software must be installed using either the Windows® 95 or the Windows® NT operating system.

3Com recommends that you exit from all Windows programs before running this Setup program.

Installing with Windows® 95. To copy software to an MS-DOS host computer's hard disk using Windows® 95, follow these instructions:

1 Insert diskette #1 containing the system software file into a disk drive. These instructions assume drive a.

2 Click the Windows 95 START button and choose the **Run** command.

The Setup screen, with the system software name, and the Setup dialog box are displayed.

3 At the command line in the Setup dialog box, enter **`a:setup`** and click *OK*.

A Welcome screen appears. You are prompted to continue or to cancel the installation. To continue, click *Next*. To cancel the installation and exit the Setup program, click *Cancel*.

You will be guided through the rest of the installation procedure by the Install Shield Wizard.

This procedure creates a file folder called `lp6000r`, which contains:

- `IMAGE` folder
- `MIBS` folder
- `README.text`

Installing with Windows® NT. To copy software to an MS-DOS host computer's hard disk using Windows® NT, follow these instructions:

1 Insert diskette #1 containing the system software file into a disk drive. These instructions assume drive a.

2 Choose **Run** from the **File** menu.

The Setup screen, with the system software name, and the Setup dialog box are displayed.

3 At the command line in the Setup dialog box, enter **`a:setup`** and click *OK*.

A Welcome screen appears. You are prompted to continue or to cancel the installation. To continue, click *Next*. To cancel the installation and exit the Setup program, click *Cancel*.

You are guided through the rest of the installation procedure by the Install Shield Wizard.

This procedure creates a file folder called `lp6000r`, which contains:

- `IMAGE` folder
- `MIBS` folder
- `README.text`

Loading System Software on the LMM+

Before loading the system software on the LMM+, verify that the host computer, which has a copy of the updated system software, is connected to the LANplex 6000 system.

You can load the system software into flash memory while the system is operating. You do not need to bring the system down. After the flash install is completed, a quick reboot puts the newly loaded software to use.

If you are loading software from a PC host, the ftp server software must be running on the PC before you begin this procedure.

Loading 8.0.2 software into flash memory takes approximately 10 to 15 minutes to complete, depending on your network load.

To load the new software:

1. From the Administration Console top-level menu, enter:

   `system softwareUpdate`

   You are prompted for the Host IP address, Install file name, User name, and Password. The current default values are displayed in brackets [ ]. The Password field does not display what you enter.

2. Next to `Host IP address`, enter the IP address of the host computer (such as a Sun workstation or PC) from which you are installing the software.

   In the example in step 5, the IP address of the host is **`192.9.200.96`**.

3. Next to `Install file pathname`, enter the complete path and file name.

For MS-DOS system syntax, you must precede the full pathname with a forward slash (/). For example, if you are loading software from an MS-DOS host, enter the following command at the `Install file pathname` *prompt:*

`/c:\lp6000R\lp6000R`

4. Next to `User name`, enter your user name.

5. Next to `Password`, enter your password. You *must* enter a value for this field.

Example of the software installation prompts.

```
Host IP address [192.9.200.14]:192.9.200.96
Install file pathname [/usr/lp6000R/lp6000R]:
User name: ronnyk
Password:
```

After the software is loaded, this message appears:

```
Installation complete.
```

If the LANplex executable software image stored in flash memory is corrupted (for example, when a power failure occurs while you are updating software), contact 3Com Technical Support.

6 To reboot the system to use the newly loaded software, enter:

```
system reboot
```

You are prompted with the following message:

```
Are you sure you want to reboot the system (n,y) [y]:
```

7 At the prompt, enter **y** for (yes).

You are now ready to configure management access for your system. For information on configuring management access for the LANplex system, see the *LANplex 6000 Getting Started* guide.

User Documentation

This version of software is compatible with the documentation revisions listed below. These release notes describe only the changes and additions to the following documentation, which comprise the LANplex 6000 system documentation set:

- *LANplex 6000 Getting Started* (Rev. 01, Part No. 800-00252-000)
- *LANplex 6000 Control Panel User Guide* (Rev. 01, Part No. 801-00255-000)
- *LANplex 6000 Operation Guide* (Rev. 02, Part No. 801-00253-000)
- *LANplex 6000 Administration Console User Guide* (Rev. 01, Part No. 801-00254-000)
- *LANplex 6000 Command Quick Reference* (Folded card; Rev. 01, Part No. 801-00258-000)
- *LANplex 6000 Extended Switching User Guide* (Rev. 01, Part No. 801-00257-000)

The Extended Switching User Guide ships with Extended Switching Software (3C96270A).

Individual modules ship with their installation guides:

- *LMM (LANplex Management Module) Installation Guide* (Rev. 01, Part No. 801-00264-000)
- *FCM (FDDI Concentrator Module) Installation Guide* (Rev. 02, Part No. 801-00192-000)
- *ESM (Ethernet Switching Module) Installation Guide* (Rev. 02, Part No. 801-00190-000)
- *EFSM (Ethernet/FDDI Switching Module) Installation Guide* (Rev. 01, Part No. 801-00256-000)
- *TRSM (Token Ring Switching Module) Installation Guide* (Rev. 01, Part No. 801-00194-000)
- *TMM (Tri-Media Module) Installation Guide* (Rev. 01, Part No. 801-00295-000)
- *FDDI Switching Module (FSM) Guide* (Rev. 01, Part No. 801-00332-000)

What's New at Revision 8.0.2?

Revision 8.0.2 updates system diagnostics.

What's New at Revision 8.0.1?

This section describes the new features, software enhancements, and corrections implemented at this release.

New Features

The following features have been added at this release:

IP Routing Support on the FSM

IP routing is supported on the FDDI Switching Module (FSM). For IP routing configuration information, see the *LANplex® 6000 Extended Switching User Guide*.

An IP interface can span multiple ports and slots that are within the same HSI Switch Engine. For information describing the HSI Switch Engine, see the FDDI Switching Module (FSM) Guide.

Software Changes and Corrections at 8.0.1

The following system issues and known problems have been corrected at this release:

- The FSM's Port Status LEDs no longer light yellow after diagnostics have run on the system when the port's FDDI MAC was assigned to the internal FDDI backplane path.
- A LANplex IP interface now responds to ping requests up to an MTU size of 4,352 bytes.
- The system display now shows the correct hardware revision number for EFSMs.
- EFSMs can now correctly handle Ethernet SNAP encapsulated 802.3 frame types.
- The TRSM no longer resets if two MAC addresses that are identical except for bits 15 and 16 are present on the attached FDDI ring.

What's New at Revision 8.0.0?

This section describes the new features, software enhancements, and corrections implemented at this release.

New Features

The following features have been added at this release.

FDDI Switching Module (FSM) Support

The FDDI Switching Module (FSM) contains two (2) DAS ports (A and B) with standard MIC connectors and two (2) optional optical bypass switches. The FDDI DAS ports provide High-Function Switching to the multigigabit High-Speed Interconnect (HSI) bus of the LANplex 6000 system. You can configure these switched FDDI segments to switch any two of the three FDDI backplanes of the LANplex 6000 system to the HSI bus.

The FSM is fully compliant with all IEEE 802.1d specifications. For more information about the FSM, see the *FDDI Switching Module (FSM) Guide* (Part No. 801-00332-000).

EFSM TP-DDI Module

A new media option has been added for the EFSM. The new module contains eighteen (18) switched segments, including sixteen (16) Ethernet ports that use RJ-45 connectors, one (1) external TP-DDI port that uses an RJ-45 connector, and one (1) internal FDDI port.

LANplex Extended switching software 8.0.0 or greater requires 2 MB EFSMs. The EFSM TP-DDI module does have 4 MB of memory, although its lower ejector tab label is blank. See "Extended Switching Software Requirement" on page 6.

Support for RMON

Revision 8.0.0 or greater of LANplex software offers Full-Time Embedded RMON support for Ethernet and Fast Ethernet ports through SNMP for four RMON Groups. When combined with the Roving Analysis Port (RAP) function, RMON support for these four groups provides a comprehensive, powerful mechanism for managing your network. This release supports the following RMON groups:

- Statistics Group (group 1) — Maintains utilization and error statistics for the segment being monitored.
- The History Group (group 2) — Holds periodic, statistical samples from the statistics group and stores them for later retrieval.
- The Alarm Group (group 3) — Allows you to define thresholds for any MIB variable and trigger an alarm.
- The Events Group (group 9) — Allows you to define actions based on alarms such as generate traps, log the alarm, or both.

The RMON MIB contains standard MIB variables defined to collect comprehensive network statistics to alert a network administrator about significant network events. If the Embedded RMON agent operates full time, it collects data on the correct port at the time the relevant network event occurs.

You must assign an IP address to the LANplex system to manage RMON. See the LANplex® 6000 Administration Console User Guide *for information on how to assign an IP address.*

Configuring the RMON state of etherStatsStatus, historyControlStatus, alarmStatus, and eventStatus from the nonexistent state to underCreation can now be facilitated by setting "valid".

RMON MIB Support Added. RMON MIB support has been added for:

- Statistics
- History
- Alarm
- Event

State Field Added to the Interface Display

A new field, *state*, has been added to the interface display table, allowing you to view the state of all interfaces configured for each switching module in the system.

The interface state is determined based on the state of all ports associated with the interface. For IP or IPX, the state displayed is either *up* or *down*. The AppleTalk® state now has one additional state, named *down*.

The interface state is displayed as *down* if:

- No port in the defined interface, including those in overlapping subnets, has established link status. Link status is *not* established for FDDI DAS ports when *neither* the A port nor the B port has established link status.

The interface state is displayed as *up* if:

- One or more ports in the defined interface, including those in overlapping subnets, have established link status.

As the interface state changes, transitions are reflected in the corresponding tables for all directly connected and associated routes, as shown in Table 1.

Table 1 Interface Display Tables That Are Updated as the Interface State Changes

IP	IPX	AppleTalk
Routing Table	Routing Table	Routing Table
Static Route Table	Server Table	Zone Table

IPX transitions time out immediately. For IP and AppleTalk transitions, all routes associated with the interface time out in the same manner as do learned routes that are not updated.

If link status is transitioned, you do not have to redefine previously defined configurations, such as static routes.

System upTime Menu Item Added

You can display the length of time — in minutes, hours, and days — since the last system reboot.

To display system upTime:

1 From the top level of the Administration Console, enter:

```
system upTime
```

System upTime is displayed.

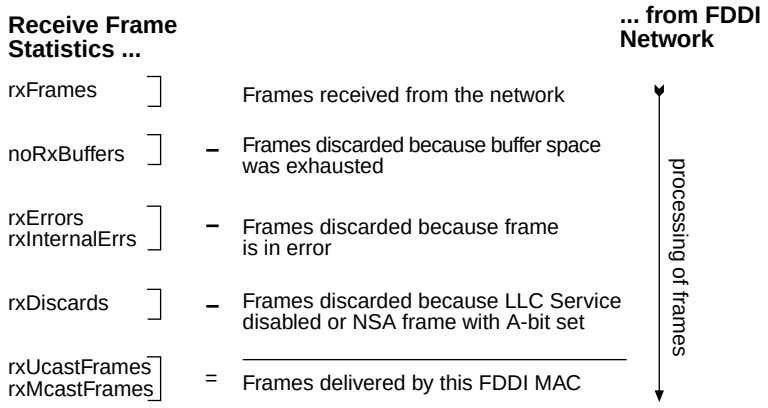
New FDDI MAC Statistic Added

A new FDDI MAC statistic, *rxErrors*, has been added. This statistic gives the total number of error frames received by this MAC, while the statistic *errorCount* gives only error frames received by this MAC without the Ebit set.

All frames on the FDDI network are received promiscuously by an FDDI MAC. A frame might be discarded for these reasons:

- There is no buffer space available.
- The frame is in error.
- LLC service is disabled.
- This is an NSA frame and the A-bit is set.

This example shows the order in which these discard tests are made:



New Fields Added to FDDI MAC Summary and Detail

Five fields — *currentPath*, *location*, *rxErrors*, *smtAddress*, and *station* — have been added to the summary display for the FDDI MAC. The field *rxErrors* has been added to the detail display. Field descriptions, a sample FDDI MAC summary, and a sample FDDI MAC detail are shown here.

Table 2 New Fields in the FDDI MAC Displays

Field	Description
currentPath	Path on which this MAC is currently located (*primary* or *secondary*)
location	FDDI ring to which this MAC is currently assigned (*backplane path* or *FDDI port*)
rxErrors	The total number of errored frames received by this MAC
smtAddress	Address of the MAC used for SMT frames
station	FDDI station to which the FDDI port is configured (*backplane_1*, *backplane_2*, *backplane_3*, or *external*)

Example summary display of FDDI MAC information:

```
slot  mac          location        currentPath           station
   2    1         backplane            primary       backplane_1
   2    2         fddiPort             primary          external

slot  mac          rxFrames          txFrames            rxBytes
   2    1                2                 1                242
   2    2                0                 1                  0

slot  mac           txBytes            Errors       noRxBuffers
   2    1              121                 0               121
   2    2               81                 0                81

slot  mac          rxErrors       txQOverflows        smtAddress
   2    1              121                 0   00-80-3e-10-b7-16
   2    2               81                 0   00-80-3e-10-b7-17

slot  mac          upstream        downstream
   2    1           unknown           unknown
   2    2           unknown           unknown
```

Example detail display of FDDI MAC information:

```
slot  mac           rxFrames            rxBytes         rxFrameRate
   2    1                 18               2102                   0
   2    2                  0                  0                   0

slot  mac         rxByteRate     rxPeakFrameRate      rxPeakByteRate
   2    1                  0                   5                 526
   2    2                  0                   0                   0

slot  mac          lostCount          lateCount     notCopiedCount
   2    1                  0                   0                   0
   2    2                  0                   0                   0

slot  mac     notCopiedThresh      notCopiedRatio       notCopiedCond
   2    1               6550                   0            inactive
   2    2               6550                   0            inactive

slot  mac         errorCount     frameErrThresh     frameErrorRatio
   2    1                  0                 655                   0
   2    2                  0                 655                   0

slot  mac       frameErrCond        noRxBuffers            rxErrors
   2    1           inactive               1051                1051
   2    2           inactive                389                 389

slot  mac     tvxExpiredCount      rxInternalErrs         rxDiscards
   2    1                  0                   0                  10
   2    2                  0                   0                   0

slot  mac         rxUnicasts       rxMulticasts           txFrames
   2    1                  4                   4                  11
   2    2                  0                   0                   5

slot  mac           txBytes       txFrameRate         txByteRate
   2    1              1051                   0                   0
   2    2               389                   0                   0

slot  mac     txPeakFrameRate      txPeakByteRate      txInternalErrs
   2    1                  3                 263                   0
   2    2                  1                  81                   0

slot  mac       txQOverflows         txDiscards         txUnicasts
   2    1                  0                   0                   4
   2    2                  0                   0                   0

slot  mac       txMulticasts          frameCount          tokenCount
   2    1                  7                1746            66092634
   2    2                  6                  34           518145081

slot  mac        ringOpCount        currentPath        dupAddrTest
   2    1                  3            primary             passed
   2    2                  2            primary               none

slot  mac      duplicateAddr     upstreamDupAddr       llcAvailable
   2    1              false               false               true
   2    2              false               false               true

slot  mac         llcService         smtAddress           upstream
   2    1            enabled   00-80-3e-10-b7-16   00-80-3e-10-b7-01
   2    2            enabled   00-80-3e-10-b7-17            unknown

slot  mac        downstream        oldUpstream      oldDownstream
   2    1   00-80-3e-10-b7-40            unknown            unknown
   2    2            unknown            unknown            unknown

lot  mac     downstreamType           rmtState          tMaxCapab
   2    1            unknown            ring op         1342200 us
   2    2            unknown            ring op         1342200 us

slot  mac           tvxCapab               tReq               tNeg
   2    1         1342200 us          164986 us           164986 us
   2    2         1342200 us          164986 us           164986 us

slot  mac               tMax           tvxValue
   2    1          167770 us            2621 us
   2    2          167770 us            2621 us
```

Source Route Hop Count Limit Now Configurable

You can now restrict token ring traffic by configuring the Source Route (SR) hop count limit.

To configure the SR hop count limit, from the top level of the Administration Console, enter:

```
srHopLImit
```

You are prompted to enter the limit you want. You may set a limit from 1 through 7. The default is 7.

LANplex MIB Support Updates Added

LANplex MIB support has been added for:

- File transfer of flash and NVRAM images
- Enhanced FDDI MAC and Port configuration
- SNMP community string configuration
- Control panel access lock
- Remote console session lock
- Console password configuration
- Date/time configuration
- FDDI backplane station mode configuration

Bridge MIB Support for the FSM

Support for the FSM has been added to the **bridge.mib**.

New IF MIB Added

The new **if.mib** has been added at this release. This MIB supports:

- IfStackTable
- ifXTable
  - ifName
  - ifLinkUpDownTrapEnable

Software Changes and Corrections at 8.0.0

The following system issues and known problems have been corrected at this release:

- IP RIP cannot be set to *active* unless IP routing is enabled.
- IP icmpRouterDiscovery cannot be enabled unless IP routing is enabled.
- IP routing cannot be disabled unless IP RIP is not active and IP icmpRouterDiscover is disabled.
- The LMM+ no longer hangs when assigning an RNM probe to an ESM port.
- The LMM+ no longer hangs in networks with excessive collisions.
- Assigning filters to ESM ports no longer causes a system reboot.

System Issues

The following system issues are identified at this release:

- The system software does not support hot swap of FDDI Switching Modules (FSMs) in this release.
- 3Com recommends that you hot swap one module at a time (except FSMs, as described in the previous System Issue). After hot swapping the module, wait until the system completes full initialization before installing another module. One indication that initialization is complete is that the Administration Console prompt appears on the screen. Under certain circumstances, hot swapping during initialization can cause a cold system boot, disrupting bridging.
- A maximum of 254 unique RMON Owner descriptions (*etherStatsOwner, historyControlOwner*, *alarmOwner*, and *eventOwner*) can be configured.
- Packet filtering is *not* available on frames that will be routed by the LANplex system.
- A maximum of 100 routing interfaces can be configured for all switching modules in a single LANplex 6000 system.
- When connected to the MBONE (the Internet's multicast backbone) and multicast routing is enabled, you should configure a maximum of 3 slots for multicast routing.
- When using the Administration Console to display all instances of a given MAC address in a mixed Token Ring and Ethernet environment, you must use the **`find`** command for both the noncanonical and canonical formats.

- Roving Analysis frames over a remote Fast Ethernet connection are truncated if greater than 1495 bytes.
- ESMs do not support IGMP snooping. IP multicast traffic should be filtered using a packet filter to avoid unwanted traffic.
- EFSM packet filters can access packet data through byte 64 in the packet.
- Bridging and routing performance are degraded on a Roving Analysis monitor port.

Known Problems

The following software problems are identified at this release:

- Roving Analysis cannot monitor outgoing routed packets.
- LANplex system software does not route FDDI multicast frames larger than 1500 bytes (that is, frames that require fragmentation).
- When you install software using the SNMP lpsFt MIB, the install fails unless you specify a user password.
- When you install software from an unreachable device using the SNMP lpsFt MIB, the system reports the incorrect status "statusFileNotFound", rather than the correct status "statusRemoteUnreachable".
- When you install software using the SNMP lpsFt MIB and you specify an invalid username/password pair, the system reports the incorrect status "statusFileNotFound", rather than the correct status "statusUserAuthFailed".
- An NVDATA save procedure fails if it occurs at the same instant when a MAC address is learned or aged out of the slot's MAC address table.
- The FDDI MAC RxFrames, TxFrames, Rxbytes, and Txbytes statistics might report inaccurate values.
- FCS error statistics report inaccurate values on the TMM's Fast Ethernet port.
- The ESM and TRSM incorrectly report transmit filter statistics.
- The ESM and TRSM FDDI packet filters cannot access packet data beyond byte 16 in the packet.
- If both the Ethernet and the FDDI interfaces have the same class of IP address, their subnet masks must be the same, although the Administration Console allows you to enter different subnet masks for these interfaces. If

you do this, however, the system fails when you attempt to remove one of the interfaces.

In the following example, the FDDI and the Ethernet interfaces both have class B IP addresses, and both have the same subnet mask:

FDDI interface **`158.101.101.1`** Subnet mask: **`255.255.0.0`**
Ethernet interface: **`158.101.20.1`** Subnet mask: **`255.255.0.0`**

Do not assign different subnet masks to these interfaces (such as **`255.255.255.0`** and **`255.255.0.0`**) if they have the same class of IP address.

- Changing the port speed or port mode before setting a system baseline on the TRSM might cause incorrect Token Ring port and bridge port statistics.
- The NVRAM conversion for SNMP traps does not adjust correctly for two new additions to the trap table. After installing LANplex software revision 8.0.2, verify that the appropriate traps are enabled.
- Some bridge port statistics are not counted on the TRSM's Token Ring ports. The following statistics report 0 in the bridge port display for Token Ring ports on the TRSM:
  - rxDiscard
  - rxFloodUcasts
  - rxForwardMcasts
  - rxForwardUcasts
- System does not display the correct hardware revision number for EFSMs.
- When running large scripts, you might receive the following message after the script is complete:

  ```
  Received ftpCommand Quit not completed errno 421
  ```

  To be sure that the script has completed successfully, check to see that the last two commands in the script have completed successfully.
- Performing a manual NVDATA RESTORE causes configurations to be restored to slots that have been specified *not* to restore.

  When restoring NV data, the system proposes a method of restoration based on restoration rules. You are prompted to load the proposal. Entering **`yes`** restores the system NV data as proposed. Entering **`no`** displays the saved configuration for you to load manually.

SNMP MIB Files

SNMP MIB files are shipped with the LANplex system software as ASN.1 files on one of the software diskettes. Copies of ASN.1 files are provided for each of the supported compilers described at the end of this section.

Supported Versions

The SNMP MIB file names and the currently supported version of each MIB are listed here:

- **bridge.mib** — Bridge MIB, RFC 1493
- **ethernet.mib** — Ethernet MIB, RFC 1398
- **if.mib** — If MIB, RFC 1573
- **fddiSmt7.mib** — FDDI SMT 7.3 MIB, RFC 1512
- **lp.mib** — LANplex Systems MIB, version 1.3.0
- **lpOpFddi.mib** — LANplex Optional FDDI MIB, version 1.2.1
- **mib2.mib** — MIB-II, RFC 1213
- **srbridge.mib** —Source Routing MIB RFC1525

Compiler Support

ASN.1 MIB files are provided for each of the MIB compilers listed in this section. Any warnings or exceptions related to a compiler are listed with it.

- SMIC (version 1.0.9)
- MOSY (version 7.1)

  For the MIB file *lpOpFddi.mib*, the MOSY compiler reports warnings for counter names that do not end in "s". This report has no effect on the output produced by the MOSY compiler.

- HP Openview (version 3.1)

- mib2schema (with SunNet Manager version 2.0)

  The MIB file *fddiSmt7.mib* produces the following warning messages when compiled using mib2schema:

```
Translating....
Warning: The following INDEX entries in
fddimibMACCountersTable not resolved:
   fddimibMACSMTIndex
   fddimibMACIndex
Translation Complete.
Schema file in “fddiSmt7.mib.schema”
Oid file in “fddiSmt7.mib.oid”
```

  These warning messages have no effect on the ability of SunNet Manager™ to use the schema file generated with SunNet Manager versions 2.0 or later.

Revision History

The following table provides a brief description of the previous releases of the LANplex 6000 Extended Switching software.

Table 3 Revision History for LANplex® 6000 Extended Switching Software

Revision Number	Description of Release
8.0.1	■ Support for IP routing on the FDDI Switching Module (FSM)
8.0.0	New features: ■ Support for the FDDI Switching Module (FSM) ■ Support for the EFSM TP-DDI Module ■ Support for RMON ■ RMON MIB support added ■ *State* field added to interface display ■ System menu item *upTime* added ■ New FDDI MAC statistic *rxErrors* ■ New fields added to FDDI MAC summary and detail displays ■ Configurable Source Route hop count limit ■ LANplex MIB support updates ■ Bridge MIB support added for the FSM ■ New If MIB added
7.0.0	New features: ■ Support for the Tri-Media Module (TMM) ■ Support for IP Multicast on the Ethernet/FDDI Switching Module (EFSM)* ■ Support for the IBM Spanning Tree Protocol on the Token Ring Switching Module (TRSM) ■ Support for configuring the Spanning Tree Protocol (STP) group address ■ Support for Token Ring and Source Routing MIBs ■ Menu change (ip forwarding to ip routing) ■ Configuration change to enable or disable routing ■ Support for telnet and rlogin session termination after a user-specified time interval ■ Support for 64 IP static routes on each EFSM

Table 3 Revision History for LANplex® 6000 Extended Switching Software (continued)

Revision Number	Description of Release
6.0.0	New features: ■ Support for the Token Ring Switching Module (TRSM)
5.0.0	New features: ■ Support for LMM+, the memory management module ■ Support for IPX Routing ■ Support for AppleTalk Routing
4.3.0	New features: ■ UDP Helper ■ IPX Snap Translation Option ■ Support for EFSM Type 1, 10BASE-2 (BNC) option module ■ Support for EFSM Type 2, 10BASE-T (RJ-45) and 10BASE-FL (FOIRL) option modules with SAS FDDI (MIC) ports ■ Support for Single Mode Fiber (SMF) on the FCM option module ■ Support for the 48-volt power supply
4.1.0	New features: ■ Support for EFSM Type 1, 10 BASE-T (RJ-21, Telco), 10BASE-T (RJ-45), and 10BASE-FL (FOIRL) ■ Roving Analysis for Ethernet network monitoring (ESM and EFSM) ■ Support for Multiple SNMP Agents ■ Multi-station Mode ■ FDDI Backplane Paths ■ Enhanced Administration Console User Guide
3.1.9	Maintenance release
3.1.7	Maintenance release MIB support removed: ■ The Ethernet MIB attributes, *requestedEnabledPaths* and *enabledPaths*, are no longer supported. ■ LANplex SNMP MIB traps, *lpBridgePortAddressLearnedEvent* and *lpBridgePortAddressForgottenEvent*, are no longer supported.

(continued)

Table 3 Revision History for LANplex® 6000 Extended Switching Software (continued)

Revision Number	Description of Release
3.1.5	New feature: ■ Support for SMT MIB path attribute *Ring Latency*
3.1.4	New features: ■ ESM 10BASE-2 (BNC) media support ■ IP broadcast address configuration support
3.1.1	New features: ■ IP routing functionality ■ TP-DDI media support ■ Nonvolatile data save and restore functionality
3.0.1	New feature: ■ Baselining of Ethernet and FDDI statistics functionality

Technical Support

This section describes technical support information for 3Com products.

Support from Your Network Supplier

Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Diagnostic error messages
- A list of system hardware and software, including revision levels
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to receive support from your network supplier, technical support contracts are available from 3Com.

In the U.S. and Canada, call **(800) 876-3266** for customer service.

If you are outside the U.S. and Canada, contact your local 3Com sales office to find your authorized service provider:

Country	Telephone Number
Australia*	1800 678 515
Belgium*	0800 71429
Brazil	(55) (11) 546 0869
Canada	(905) 882 9964
Denmark*	800 17309
Finland*	0800 113153
France*	05 917959
Germany*	0130 821502
Hong Kong	(852) 868-9111
Ireland*	1 800 553117
Italy*	1678 79489

Country	Telephone Number
Japan	(81) (3) 3345 7251
Mexico	(525) 531 0591
Netherlands*	06 0227788
Norway*	800 11376
Singapore	(65) 538 9368
South Africa	(27) (11) 803 7404
Spain*	900 983125
Sweden*	020 795482
Taiwan	(886) (2) 577 4352
United Arab Emirates	(971) (4) 349049
U.K.*	0800 966197
U.S.	(1) (408) 492 1790

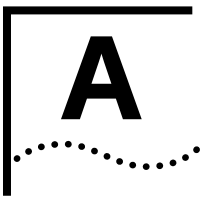
* These numbers are toll-free.

Returning Products for Repair

Before you return a product sent directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. A product sent to 3Com without an RMA number will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
U.S. and Canada	(800) 876 3266, option 2	(408) 764 7120
Europe	31 30 60 29900, option 5	(44) (1442) 275822
Outside Europe, U.S., and Canada	(1) (408) 492 1790	(1) (408) 764 7290



IP MULTICAST ROUTING

This appendix describes how to set up your LANplex® system to use IP multicast routing. Before you define any IP multicast interfaces, you should have previously defined IP interfaces and routes as described in the *LANplex® 6000 Extended Switching User Guide*.

This appendix includes information on how to display or configure the following parameters:

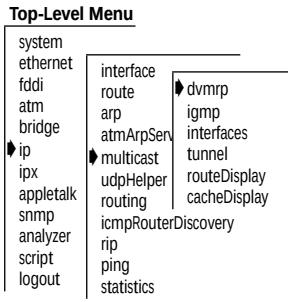
- Enabling and disabling the Distance Vector Multicast Routing Protocol (DVMRP)
- Enabling and disabling the Internet Group Membership Protocol (IGMP)
- Administering IP multicast interfaces
- Administering multicast tunnels
- The Route display
- The Cache display

Enabling and Disabling DVMRP

DVMRP is the simple Distance Vector Multicast Routing Protocol, similar to the IP Routing Information Protocol. Multicast routers exchange distance vector updates that contain lists of destinations and the distance in hops to each destination. The routers maintain this information in a routing table.

To run multicast routing, you must enable DVMRP, which enables it on all IP interfaces that have not been disabled.

To enable or disable DVMRP, from the top level of the Administration Console, enter:




```
ip multicast dvmrp
```

The interface prompts you to enable or disable DVMRP. The default is *disabled*.

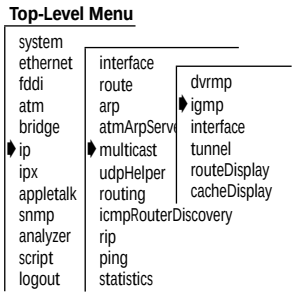
Example:

```
dvmrp mode (enabled/disabled)[disabled]: enabled
```

Enabling and Disabling IGMP

IGMP enables a router or switch to determine whether group members exist in a subnetwork, or "leaf," of the Spanning Tree. It uses two search methods to make this determination:

- **Query mode** — The router or switch with the lowest IP address in the LAN broadcasts a query to all other members of the subnetwork to determine whether they are also in the group. End-stations respond to the query with IGMP packets, which report the multicast group to which they belong.
- **Snooping mode** — A router or switch performs dynamic multicast filtering based on IGMP snooping. This procedure ensures that multicast packets are flooded only to the appropriate ports within a routing interface.



When you select the IGMP option, the interface prompts you to enable or disable IGMP snooping mode and IGMP query mode. Both are *enabled* by default. Under most conditions, IGMP snooping mode and IGMP query mode should remain enabled.

To enable or disable IGMP, from the top level of the Administration Console, enter:

```
ip multicast igmp
```

The interface prompts you to enable or disable IGMP query mode and IGMP snooping mode.

Example:

```
Enter igmp snooping mode
(enabled/disabled)[enabled]:enabled
Enter igmp query mode (enabled/disabled) [enabled]: enabled
```

Administering IP Multicast Interfaces

The IP multicast interface selections allow you to enable and disable multicast characteristics on previously defined IP interfaces. A multicast interface has three characteristics, explained next.

DVMRP Metric Value

The DVMRP metric value determines the cost of a multicast interface. The higher the cost, the less likely it is that the packets will be routed over the interface. The default value is *1*.

Time To Live (TTL) Threshold

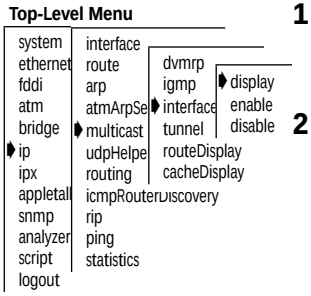
The TTL threshold determines whether the interface will forward multicast packets to other switches and routers in the subnetwork. If the interface TTL is greater than the packet TTL, then the interface does not forward the packet. The default value is *1*, which means that the interface will forward all packets.

Rate Limit

The rate limit determines how fast multicast traffic can travel over the interface in kilobytes per second. Multicast traffic may not exceed this rate limit or the LANplex system will drop packets in order to maintain the set rate. The default is set to *0*, which implies no rate limit. In all other instances, the lower the rate limit, the more limited the traffic over the interface.

Displaying Multicast Interfaces

To display a multicast interface:



1 From the top level of the Administration Console, enter:

```
ip multicast interface display
```

2 Enter the index numbers of the interfaces you want to display.

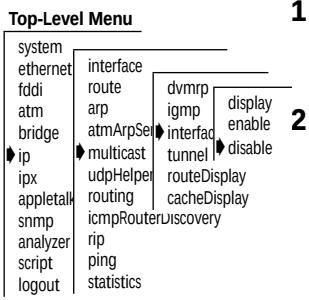
Example multicast interface configuration:

```
Index  Local Address   Metric  Threshold  RateLimit   State

 1     158.101.112.32   1       1           0         queries
                        pkts    in:0    pkts out:0
                        port    3  peers    158.101.112.204  (3.6) (0x8e)
                                            158.101.112.202  (3.6) (0x8f)
                        port    3 groups    224.2.127.255    (3.6) (0x8e)
                                            224.2.143.24
                        port    4 groups    224.2.143.24
                                            224.2.127.225
```

Disabling Multicast Interfaces

To disable multicast routing on an interface:



1 From the top level of the Administration Console, enter:

```
ip multicast interface disable
```

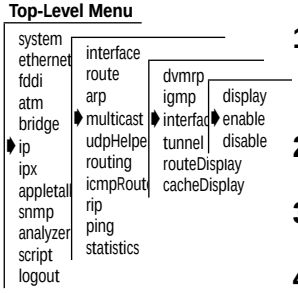
2 Enter the index number of the interface you want to disable.

The interface is disabled.

Enabling Multicast Interfaces

Multicast routing is enabled on all existing IP interfaces when you have not specifically disabled it. You can use this option to change the characteristics of an existing interface or to enable an interface that you had previously disabled.

To enable a multicast interface or modify the multicast characteristics of an existing IP interface:



1 From the top level of the Administration console, enter:

```
ip multicast interface enable
```

2 Enter the index number(s) of the interface(s) you want to enable.

3 Enter the DVMRP metric value of the chosen interface(s).

4 Enter the Time To Live (TTL) threshold of the chosen interface(s).

5 Enter the rate limit of the chosen interface(s).

Example:

```
Enter an IP interface index [1]: 2
Enter Interface DVMRP metric [1]: 1
Enter Interface TTL threshold [1]:
Enter interface rate limit in KBits/sec [0]:
```

Administering Multicast Tunnels

A multicast tunnel allows multicast packets to cross several unicast routers to a destination router that supports multicast. A tunnel has two end points. The local end point is associated with an interface on the LANplex router.

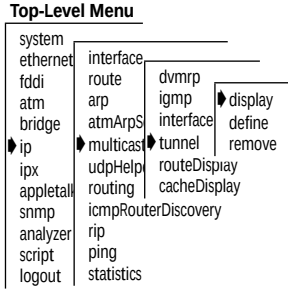
When you define the tunnel, you specify the associated index on the local LANplex router and then the characteristics of the tunnel. Tunnel characteristics are the same as those of an interface. You also specify the IP address of the remote multicast router.

Not all multicast configurations require a tunnel. The only configurations that require a tunnel are those that require a connection between two multicast internetworks through one or more unicast routers.

Displaying Multicast Tunnels

To display the IP multicast tunnel(s) on the router, from the top level menu of the Administration Console, enter:

```
ip multicast tunnel display
```

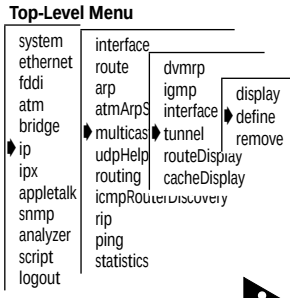


Example IP multicast tunnel configuration:

```
Index  Local Address    Remote Address Metric Threshold RateLimit State
 1     158.101.112.204 137.39.229.98  2      255       500
                       pkts in:320069 pkts out:0
                              peers  137.39.229.98  (3.8) (0xe)
```

Defining a Multicast Tunnel

To define a multicast tunnel:



1 From the top level of the Administration Console, enter:

```
ip multicast tunnel define
```

2 Enter the index number(s) of the interface(s) with which you want to associate a multicast tunnel.

3 Enter the IP address of the destination multicast router.

The IP address of the destination multicast router must be a remote address. The destination router cannot be directly connected to the same subnetworks as the local IP address.

4 Enter the DVMRP metric value of the tunnel.

5 Enter the Time To Live (TTL) threshold of the tunnel.

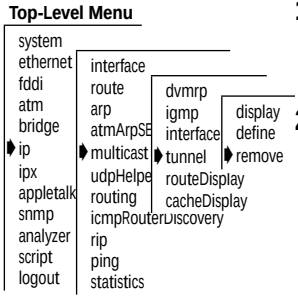
6 Enter the rate limit of the tunnel.

Example:

```
Enter an IP interface index [1]: 2
Enter remote IP address: 192.9.200.40
Enter tunnel DVMRP metric [1]: 1
Enter tunnel TTL threshold [1]:
Enter tunnel rate limit [0]:
```

Removing a Multicast Tunnel

To remove an IP multicast tunnel:



1 From the top level of the Administration Console, enter:

```
ip multicast tunnel remove
```

2 Enter the index number(s) of the interfaces associated with the tunnel you want to remove.

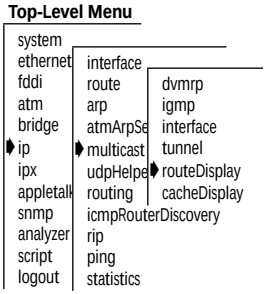
Example:

```
Enter an IP interface index [1]: 2
```

The tunnel is removed.

Displaying Routes

To display all available routes in the IP multicast routing table:



1 From top level of the Administration Console, enter:

```
ip multicast routeDisplay
```

The DVMRP and IGMP status appear on the screen.

The following display shows all available multicast routes:

```
Multicast Routing Table (2598 entries)
 Origin-Subnet      From-Gateway     Metric Tmr  In-If Out-Ifs
 157.88.29.1/32     137.39.229.98     18     25   T1    I1
 137.39.2.254/32    137.39.229.98     5      25   T1    I1
 131.215.125.236/32 137.39.229.98     14     25   T1    I1
 130.118.106.254/32 137.39.229.98     10     25   T1    I1
 129.127.118.12/32  137.39.229.98     10     25   T1    I1
 129.127.110.12/32  137.39.229.98     10     25   T1    I1
 129.127.110.11/32  137.39.229.98     13     25   T1    I1
 129.127.110.5/32   137.39.229.98     10     25   T1    I1
 129.95.63.12/32    137.39.229.98     13     25   T1    I1
 129.95.63.11/32    137.39.229.98     31     25   T1    I1*
 129.95.63.9/32     137.39.229.98     13     25   T1    I1
 129.95.63.8/32     137.39.229.98     13     25   T1    I1
 129.95.63.6/32     137.39.229.98     13     25   T1    I1
 129.95.63.2/32     137.39.229.98     13     25   T1    I1
 129.95.48.4/32     137.39.229.98     13     25   T1    I1
 129.95.48.3/32     137.39.229.98     13     25   T1    I1
 129.95.48.2/32     137.39.229.98     13     25   T1    I1
```

Table A-1 describes the fields in the route display.

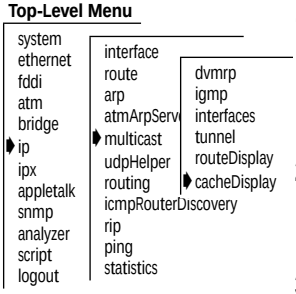
Table A-1 Field Attributes for Multicast Rout Display

Field	Description
Origin-Subnet	The source address and the number of bits in the subnetwork
From-Gateway	The interface address of the gateway
Metric	The hop count
Tmr	The amount of time, in seconds, since the routing table entry was last reset
In-If[1]	Interface number on which that gateway is connected. This is the interface where traffic is expected to originate. T represents the tunnel; P denotes that a prune has been sent to this tunnel.
Out-If[1]	Set of interfaces that the traffic will be flooded out on. I represents the interface.
[1]In-If and Out-If	Together, these attributes define a Spanning Tree configuration. Interfaces that comprise loops will be disabled

Displaying the Multicast Cache

The multicast cache contains the IP source address and destination address for packets observed on the system. The multicast cache shows you how information is routed over interfaces and ports in your system.

To display all learned routes in the multicast cache:



1 From the top level of the Administration Console, enter:

```
ip multicast cacheDisplay
```

You are prompted for the multicast source address.

2 Enter the multicast source subnetwork address.

You are prompted for the multicast group address.

3 Enter the multicast group address.

The DVMRP status and IGMP status appear on the screen.

Example:

```
Enter multicast source address [131.188.0.0]
Enter multicast group address [244.2.0.2]

DVMRP is enabled, IGMP snooping is enabled
```

The following display shows the multicast cache configuration:

```
Multicast Routing Cache Table (125 entries)
 Origin             Mcast-group     CTmr  Age PTmr In-If          Out-Ifs

>202.242.133.128/26 224.2.0.1         7m  11m   6m T1P            I1p
 202.242.133.139    2 packets
>128.84.247/24      224.2.0.1         2m  36m   2m T1P            I1p
 128.84.247.53      43 packets
 128.84.247.156     33 packets
>128.138.213/24     224.2.0.1         3m   2h   2m T1P            I1p
 128.138.213.1      23 packets
>128.206.212/24     224.2.0.1        92s  36m  60s T1P            I1p
 128.206.212.69     8 packets
>131.136.234/24     224.2.0.1         3m  57m   3m T1P            I1p
 131.136.234.103    12 packets
>138.39.25/24       224.2.0.1       103s   4h  71s T1P            I1p
 138.39.25.48       46 packets
>192.5.28/24        224.2.0.1        80s   2h  48s T1P            I1p
 192.5.28.43        178 packets
>199.94.220/24      224.2.0.1       104s   1h  72s T1P            I1p
 199.94.220.184     10 packets
>199.104.80/24      224.2.0.1         3m  32m   3m T1P            I1p
 199.104.80.5       4 packets
>132.197.248/21     224.2.0.1         4m   6m   4m T1P            I1p
 132.197.248.20     1 packets
>131.188/16         224.2.0.1         3m   5h   3m T1P            I1p
 131.188.2.54      *2492 packets  184408 bytes
>149.127/16         224.2.0.1         2m   5h  90s T1P            I1p
 149.127.6.181      56 packets
```

Table A-2 describes the fields in the CacheDisplay.

Table A-2 Information in the CacheDisplay

Field	Description
Origin	The source of the incoming packets. Entries preceded by an angle bracket (>) indicate a multicast subnet. Entries without an angle bracket beneath subnet entries are multicast routers within that subnet.
Mcast-group	The destination multicast group
CTmr	Cache timer. The amount of time a cache entry has to remain in the cache
Age	Number of seconds (s), minutes (m), or hours (h) that the cache entry has been in existence
PTmr	The time remaining, in seconds (s), minutes (m), or hours (h), before another prune will be sent to prune the Spanning Tree.
In-If	Interface number on which that gateway is connected. This is the interface that traffic is expected to originate from. T represents the tunnel; P denotes that a prune has been sent to this tunnel.
Out-If	Set of interfaces on which the traffic will be flooded out. I represents the interface.